In the claims:

For the Examiner's convenience, all pending claims are presented below with changes shown in accordance with the new mandatory amendment format. Please cancel claims 21-40 without prejudice. In addition, please add new claims 46-57.

1-40 Cancelled

41. (Previously Presented) A validation test system comprising:

a test builder to generate test program populations to test the functionality of an integrated circuit (IC);

a test generator to translate the test program populations into an executable test;

a test analyzer to execute the test program populations; and

a feedback engine to build and update a population of test programs by generating an abstract syntax tree (AST) for each test program populations.

42. (Previously Presented) The system of claim 41, wherein the feedback engine determines whether a predetermined test program population threshold has been reached after a test program populations has been executed.

43. (Previously Presented) The system of claim 42, wherein the feedback engine generates one or more mutated ASTs if it is determined that the predetermined test program population threshold has been reached.

44. (Previously Presented) The system of claim 43, wherein the feedback engine generates a mutated AST by selecting a first AST, removing a segment of the first AST and inserting a replacement segment into the first AST.

45. (Currently Amended) The system of claim 43, wherein the feedback engine generates a mutated AST by selecting a first AST and a second AST and combining a segment of the first AST with a segment of the second AST ~~to form~~.

46. (New) A method comprising:

generating test program populations at a test builder to test the functionality of an integrated circuit (IC);

translating the test program populations into an executable test at a test generator;

executing the test program populations at a test analyzer; and

generating an abstract syntax tree (AST) for each of the test program populations at a feedback engine.

47. (New) The method of claim 46 wherein generating the AST comprises the feedback engine building and updating a population of test programs.

48. (New) The method of claim 47 further comprising the feedback engine determining whether a predetermined test program population threshold has been reached after a test program populations has been executed.

49. (New) The method of claim 48 further comprising the feedback engine generating one or more mutated ASTs if it is determined that the predetermined test program population threshold has been reached.

50. (New) The method of claim 49 further comprising the feedback engine:

generating a mutated AST by selecting a first AST;

removing a segment of the first AST; and

inserting a replacement segment into the first AST.

51. (New) The method of claim 49 further comprising the feedback engine:

generating a mutated AST by selecting a first AST and a second AST; and

combining a segment of the first AST with a segment of the second AST.

52. (New) An article of manufacture including one or more computer readable media that embody a program of instructions, wherein the program of instructions, when executed by a processing unit, causes the processing unit:

generate test program populations at a test builder to test the functionality of an integrated circuit (IC);

translate the test program populations into an executable test at a test generator;

execute the test program populations at a test analyzer; and

generate an abstract syntax tree (AST) for each of the test program populations at a feedback engine.

53. (New) The article of manufacture of claim 52 wherein the program of instructions, when executed by a processing unit, further causes the feedback engine to generate the AST by building and updating a population of test programs.

54. (New) The article of manufacture of claim 53 wherein the program of instructions, when executed by a processing unit, further causes the feedback engine to determine whether a predetermined test program population threshold has been reached after a test program populations has been executed.

55. (New) The article of manufacture of claim 54 wherein the program of instructions, when executed by a processing unit, further causes the feedback engine to generate one or more mutated ASTs if it is determined that the predetermined test program population threshold has been reached.

56. (New) The article of manufacture of claim 55 wherein the program of instructions, when executed by a processing unit, further causes the feedback engine to:

generate a mutated AST by selecting a first AST;

remove a segment of the first AST; and

insert a replacement segment into the first AST.

57. (New) The article of manufacture of claim 55 wherein the program of instructions, when executed by a processing unit, further causes the feedback engine to:

generate a mutated AST by selecting a first AST and a second AST; and

combine a segment of the first AST with a segment of the second AST.